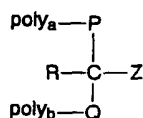


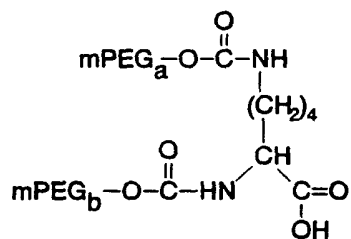
MULTI-ARMED, MONOFUNCTIONAL, AND HYDROLYTICALLY
STABLE DERIVATIVES OF POLY(ETHYLENE GLYCOL)
AND RELATED POLYMERS FOR MODIFICATION OF
SURFACES AND MOLECULES

ABSTRACT

Multi-armed, monofunctional, and hydrolytically stable polymers are described having the structure



wherein Z is a moiety that can be activated for attachment to biologically active molecules such as proteins and wherein P and Q represent linkage fragments that join polymer arms poly_a and poly_b , respectively, to central carbon atom, C, by hydrolytically stable linkages in the absence of aromatic rings in the linkage fragments. R typically is hydrogen or methyl, but can be a linkage fragment that includes another polymer arm. A specific example is an mPEG disubstituted lysine having the structure



where mPEG_a and mPEG_b have the structure $\text{CH}_3\text{O---}(\text{CH}_2\text{CH}_2\text{O})_n\text{CH}_2\text{CH}_2\text{---}$ wherein n may be the same or different for $\text{poly}_a\text{---}$ and $\text{poly}_b\text{---}$ and can be from 1 to about 1,150 to provide molecular weights of from about 100 to 100,000.